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February 2, 1994

OHM Corporation

United States Army Corps of Engineers
ATTN: CEMRO-CD-FC (Schmidt)
Building 527
Fairchild Hall, 3rd Floor
Offutt AFB, NE 68113

LETTER OF TRANSMITTAL
FINAL AMENDED WORK PLAN FOR STABILIZATION
OF HAZARDOUS WASTES IN GRANITE CITY, MADISON,
AND VENICE, ILLINOIS, ASSOCIATED WITH THE
NL INDUSTRIES/TARACORP SUPERFUND SITE

Dear Mr. Schmidt:

Attached are the revisions to the Final Amended Work Plan dated January 10, 1994. These revisions are in response to further questions submitted through January 26, 1994. OHM has only submitted the pages that required revisions. Please review these pages for the changes and then insert them into the Final Amended Work for Stabilization of Hazardous Waste dated January 10, 1994.

Please take notice that Appendix G is not included. The design of the containment pad materials is being finalized by an OHM Illinois registered professional engineer and will be sent out Friday, February 4, 1994.

Sincerely,

John R. Hitchings
Program Manager

pc: United States Army Corps of Engineers
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Project 13407

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APPENDIX F - RESULTS OF TREATABILITY STUDY

APPENDIX G - STABILIZATION PAD CONTAINMENT SYSTEM DESIGN



NL Industries, as former owner of the location, voluntarily entered into an Agreement and Administrative Order by Consent with the United States Environmental Protection Agency (USEPA) and IEPA in May 1985 to implement a Remedial Investigation/Feasibility Study (RI/FS) for the location and other potentially affected areas. Taracorp was not a party to the agreement due to the fact that it filed for bankruptcy. The USEPA determined that the location was a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) facility, and it was placed on the National Priorities List on June 10, 1986.

1.2 DESCRIPTION

This action requires the excavation, treatment, and disposal of fill material placed in alleys, parking lots, driveways, and yards in residential communities. The communities include Granite City, Madison, and Venice, Illinois. The Record of Decision (ROD) established the action levels for this project at 500 parts per million (ppm) of lead for residential areas and visibly clean for driveways, alleys, etc. Following the removal of the contaminated material, the impacted areas will be restored. This restoration will include sodding the yards and placing rock on or paving the alleys, driveways, and parking lots.

1.3 PROJECT OBJECTIVES

The objectives of this field effort are to excavate lead-contaminated soil and battery chips and confirm that all contaminated soils have been removed to the action level of 500 ppm. The hazardous wastes removed from each site will be transported to the Trust 454 site for stabilization. The stabilized waste will be treated sufficiently to characterize the wastes as nonhazardous wastes. Proper and sufficient sampling and analysis will be performed on the stabilized wastes to confirm their nonhazardous waste characterization. The nonhazardous waste will then be transported to a RCRA Subtitle D landfill. Nonhazardous wastes excavated from the site, which do not require stabilization, will be transported directly to a RCRA Subtitle D landfill.



FIGURE 2.1

**SCOPE OF WORK
PROVIDED TO OHM BY USACE**

The contractor shall be required to provide all plant, labor and material, and perform all work necessary to treat and stabilize lead (RCRA) contaminated soil and battery chips and other debris. It is estimated that the amount of contaminated soil is between 3,000 to 5,000 tons.

The site for processing shall be furnished to the contractor rent free, water and electricity are accessible at site. Hook up, metering and payment for utilities shall be the responsibility of successful subcontractor. The contractor shall obtain all necessary permit for his operations and material shall be processed within the time frame required by Haz waste regulation.

Samples shall be provided for bench test, which will be performed on the soil to determine what process will be necessary to stabilize the lead to meet RCRA Disposal Requirements for Special Waste.

The soil shall be delivered to the staging area and stockpiled by others. The successful contractor will perform tests, treat and stabilize the soil from the stockpile, and document tests necessary to certify shipment according to DOT and OSHA regulations. Perimeter air monitoring will be performed by the prime contractor for dust control efforts.

The subcontractor will have to cooperate with the prime contractor on off-loading and loading of stockpiles in the immediate area.

The analytical report of the soils will be furnished to the subcontractor before receipt of material.

22, October 93
Rev. 5



The excavation techniques employed at each location will vary according to location accessibility and the depth and extent of material to be removed. Minimization of disturbances to adjoining properties/areas will also be a key consideration in performing each excavation. OHM anticipates using tracked excavators, backhoes, Bobcats, and manual removal methods.

Dust control will be a major effect. A hydro meter and hose will be available at all times to prevent fugitive emissions. Water from decontamination sources will be recycled this way.

OHM's schedule (as discussed in Section 3.1) for excavation has been developed to facilitate logistics management and limit the time required to transport equipment and crews from location to location. During excavation activities, engineering controls and security measures such as surrounding the exclusion zones with fluorescent orange PVC barrier fencing will be employed to prevent cross contamination and unauthorized entry to exclusion zones.

After receiving analytical result(s) that confirm the cleanup criteria of 500 ppm has been achieved, OHM will restore the locations to preremedial conditions. Excavations will be backfilled with clean soils and paving completed as required by the Scope of Work. Fencing and other structures removed during remediation will be replaced and sodding, seeding, and revegetation performed where necessary.

OHM will utilize a local fill source chosen for the quality of fill and price. OHM will collect one sample of the backfill source to be used for the restoration activities. Additional backfill samples may be necessary if the soil composition/appearance changes noticeably. The anticipated analyses for the backfill sample include volatile and semivolatile organics, pesticides, and RCRA metals.

2.6 TESTING OF SOILS FROM CLEANUP LOCATIONS

At the residential areas, OHM will screen samples on site to quickly determine the levels of lead using XRF technology. The XRF screening will be performed to assist in removal of all material in the residential areas above 500 ppm lead. Sampling locations will be selected in the excavation area from 20 foot grids.

A minimum of three verification samples from each excavation at the residential locations will be sent to an off-site laboratory for analysis. The CSAP has the explicit formula for determining the number of samples and the estimated number of samples per location. The areas will be backfilled and restored after verification sampling.

2.7 TREATMENT OF SOIL MATERIALS WITH PORTLAND CEMENT

2.7.1 Introduction

Stabilization is a chemical/physical process which immobilizes hazardous constituents enabling the treated waste to meet or exceed federal and state standards prior to land disposal.



The basic components of the stabilization process include:

- ▶ Powerscreen
- ▶ Crusher
- ▶ Waste Receiving Hopper
- ▶ Reagent Storage Silo
- ▶ Pugmill
- ▶ Belt Conveyors
- ▶ Various equipment and controls to operate the facility

See Figure 2.2 for an overview of the stabilization process.

2.7.2 Performance Criteria

The stabilized material will meet the applicable "treatment standards" specified in 40 CFR 268.41 which is 5 mg/l for D008. In order to meet the aforementioned criteria, OHM proposes to implement the treatment process described in the following sections. OHM will perform one full TCLP analysis on a representative waste sample to verify lead is the only constituent to fail prior to treatment operations.

2.7.3 Site Layout

The proposed location for the process equipment is shown on Figure 2.3, Site Map. The stabilization equipment requires no special structural foundations such that location in Seismic Zone No. 1 would be any special concern. The site is also outside the 500 year Flood Plain as exhibited last summer. There are no adjacent properties or structures located within 100 feet of the proposed location. Trucks will be received on a circular road from State Street for receiving and shipping wastes.

The site will have haul roads designated for hauling hazardous waste and the processed waste on the containment pad. The receiving and shipping roadway will be repaired with gravel where too soft for truck traffic and covered with a geotech fabric to prevent decontamination of truck tires. Existing conditions indicate an entire area covered with slag previously for the employee parking lot and will withstand truck traffic. Any gravel used for repairs will be minimized and will remain on site. Trucks will be manifested as approved by IEPA and will enter from the State Street fence gate. OHM anticipates receiving eight dump trucks (230 tons) per day and foresees no traffic congestion. The processed waste will be hauled by a rubber-tired front-end loader to stockpiles awaiting shipment after passing TCLP analysis. Landfill haul trucks will have a clean dedicated haul road to ship approved processed waste. OHM expects to ship 20 trucks (400 tons) to the landfill per 8-hour day. No special traffic control will be required.



Stabilization Preparation

Stabilized Waste Placement

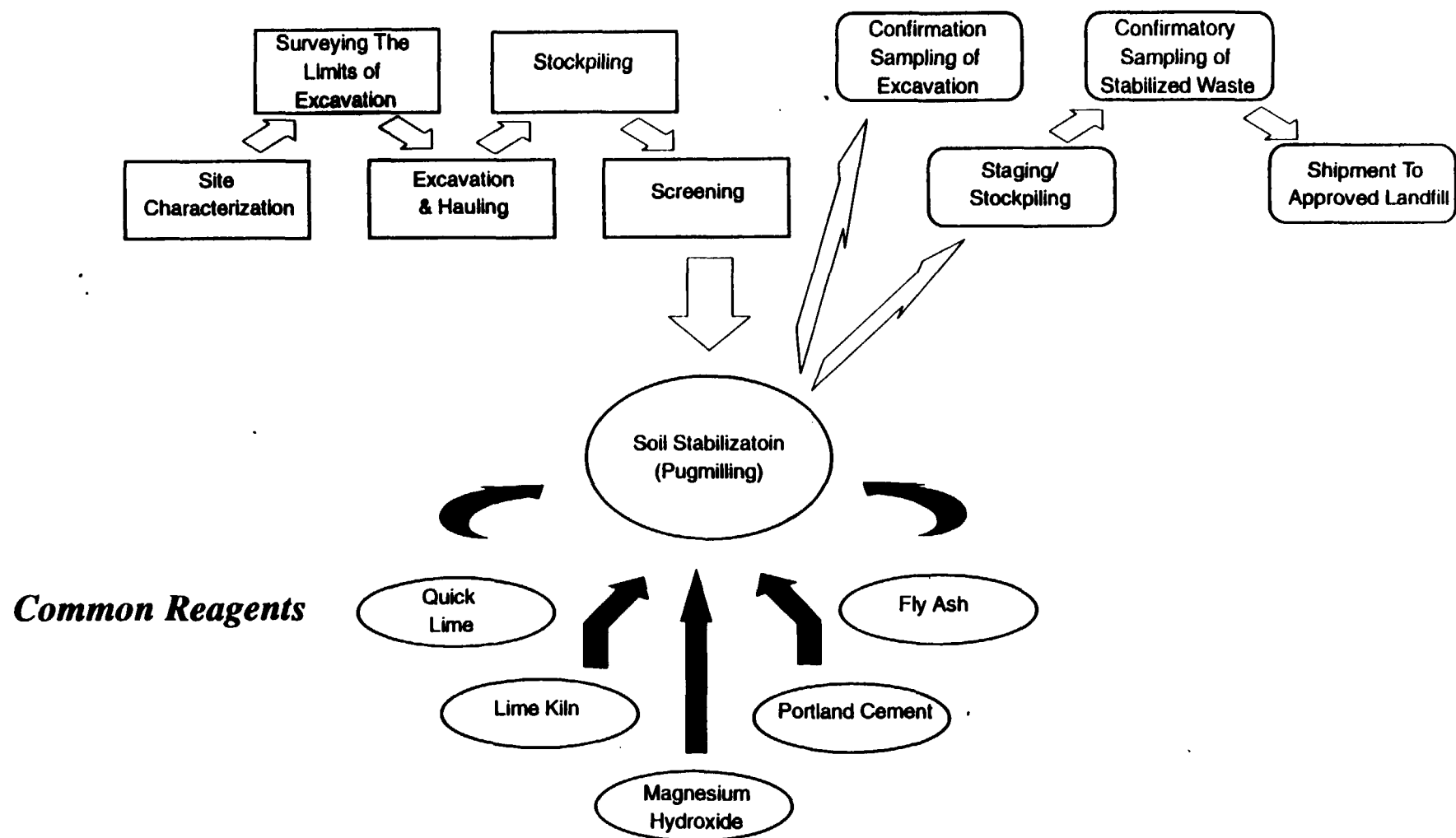


FIGURE 2.2

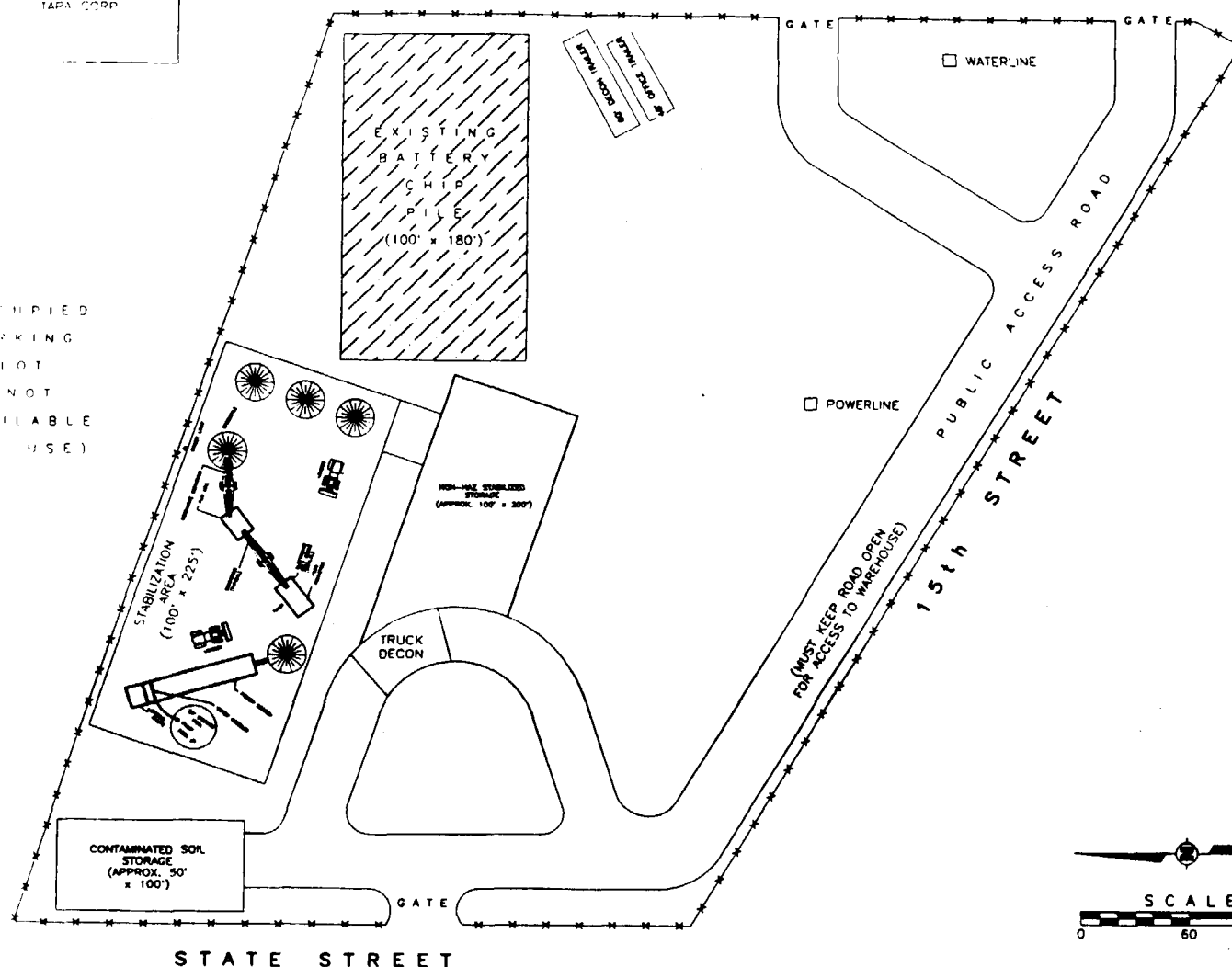
STABILIZATION METHODOLOGY

TRUST 454
TARA CORP

(NEAREST OCCUPIED
BUILDING 30'
FROM FENCE)

OCCUPIED BUILDING

OCCUPIED
PARKING
LOT
(NOT
AVAILABLE
FOR USE)



General Notes:

No.	Revised/Issued	Date

FIGURE 2.5
SITE MAP

GRANITE CITY
GRANITE CITY, ILLINOIS

OHM Corporation
Findlay, Ohio

Drawn By L. DUNN	Checked By
Date 6-29-99	Approved By
Scale AS SHOWN	Project No. 0502-97

A temporary waste storage structure will be provided to store hazardous battery casings/soil. The floor of the structure will be protected with an HDPE liner beneath 6 inches of compacted CA-6 stone and a top cover of a lighter HDPE liner to prevent further migration of lead into existing contaminated soils. Design for this containment system is in Appendix G. Typical HDPE specifications are in Appendix D and are generally accurate for this application. When the actual material is purchased, more details will be provided. The HDPE and CA-6 stone will be disposed at the end of the project. A berm will be built around the temporary storage area to control run-on and run-off in the storage area. This containment will be sloped to a sump to collect run-off. The run-off water will be pumped as needed to the water holding tank for the pugmill process. The temporary storage structure will be structurally capable of support during wind, rain, and snow for this geographical area.

The stabilization area will also be protected by an HDPE liner/CA-6 stone/HDPE liner to prevent further soil contamination. A berm will be built around the perimeter of the stabilization area to prevent run-on and run-off. The area will be sloped to a sump to collect run-on and run-off. Any water buildup in the stabilization area will be pumped into the holding tank for reagent mixing. The nonhazardous storage area will be constructed with the same materials and slope.

All mobile equipment will have fire extinguishers mounted in the operators cab. Dry chemical fire extinguishers will be placed around the pugmill and conveyor. Access to a fire hydrant is available on the property.

2.7.4 Equipment Specifications

The process system consists of the following components and major accessory equipment:

- ▶ One powerscreen - Mark III
- ▶ One 8 cubic yard feeder belt with hydraulic controlled conveyors
- ▶ One 24-inch by 30-foot conveyor with belt scraper and belt scales
- ▶ One pugmill with twin shafts, twin drives with increased horsepower for shaft speeds of 90 rpm, contour liner, hinged cover, inlet and outlet chutes with an adjustable slide gate, support structure with stairways and catwalks, water spray bars, water pump, and meter
- ▶ One 300-barrel steel reagent silo with positive feed drives, solids flow meter, and top-mounted baghouse
- ▶ One 24-inch by 40-foot discharge conveyor with support structure, belt scraper, and belt scales



- ▶ One skid-mounted control house with power supply, AC inverters, electrical switch gear, control console with manual controls, and ratio control package

Information on the equipment can be found in Appendix E including the pugmill design standard. Process equipment can be viewed in Figure 2.4

2.7.5 Process Description

Overview

OHM's stabilization system will consist of a variety of feeders, conveyors, silos, and a pugmill mixer integrated into a complete system for the continuous mixing of wastes and reagents. The contaminated soil will be fed to a live bottom feeder and then by conveyor into the pugmill for blending with the stabilization additive. As the untreated material enters the pugmill, it will pass over a weigh belt unit to record the tonnage of the material to be treated. The weigh belt provides a continuous record of the performance of the stabilization system. The stabilization additive material will be introduced from the silo feeder which attaches to the pugmill. The silo feed rate is correlated with the weight belt reading to ensure the appropriate ratio of stabilization additive is delivered to the pugmill in a consistent manner. The treated material will be conveyed to a storage area for verification testing. Following confirmation that the treatment requirements have been met, the stabilized material will then be loaded for disposal off site. A process flow can be viewed in Figure 2.5.

Soil and Debris Grinding

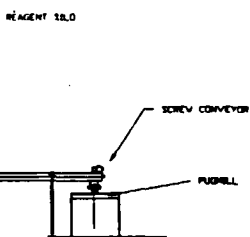
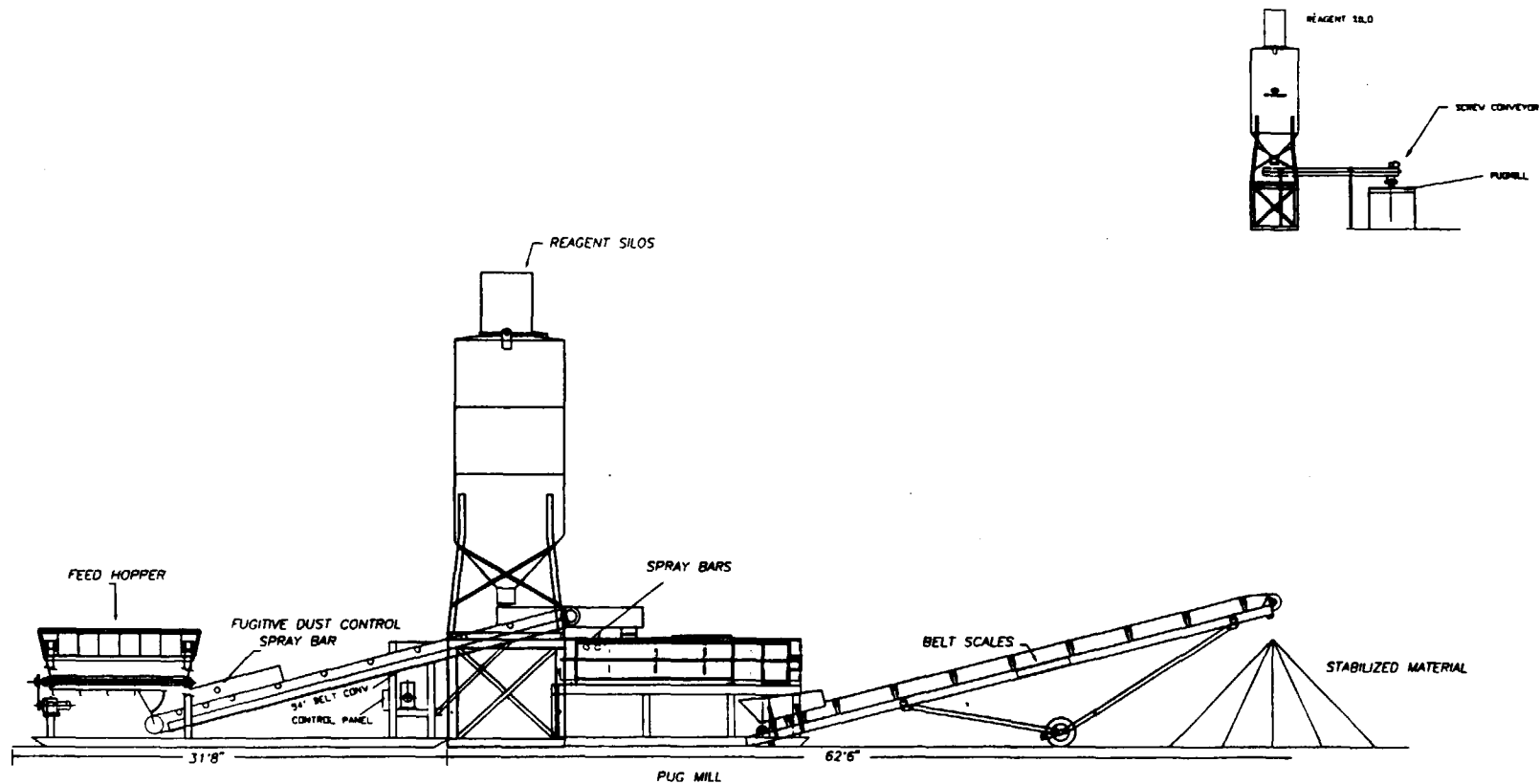
The pugmill anticipated for use in remediation is limited to accepting materials, when measured along the longest axis, of less than 2 inches. As a result, large soil and debris material must be removed and size-reduced prior to stabilization. A powerscreen will be utilized for material separation and classification. This unit is equipped with a grizzly and shredder system. The hopper discharges to a 48-inch wide by 36-foot long conveyor to a double deck screen. The material passing through the screen will be stockpiled for further processing.


Oversized material will be stockpiled until sufficient volume justifies mobilization of a grinder. The oversized material will be run through the grinder and reduced to less than 2 inches. The material will then be added to the feed system for stabilization. Fugitive dust will be controlled by hand water spraying when visible.

Material Feeding

The size-reduced and screened soil and debris would be fed from stockpiles into a live bottom feeder and then by conveyor to the pugmill. A front-end loader or trackhoe will load the screened material into the hopper. The feed rate of material placed in the feed hopper is





 OHM CORPORATION					
FIGURE 24 PROCESS EQUIPMENT ELEVATIONS GRANITE CITY GRANITE CITY, ILLINOIS					
DESIGNED BY	DATE	11-2-60	SCALE	AS SHOWN	REV
CHECKED BY			INCHES		0
APPROVED BY			FEET		
					PUGSYSA

REF: PUGSYS
2-11

controlled by the operator. The operator adjusts the feed gates to the proper opening setting, based on various calibration data. The feed rate can be adjusted from 0 tons per hour at the closed position to 80 tons per hour at the maximum, open position. Precise feed rates would be maintained by the operator.

The contaminated soil will be conveyed to the pugmill and passed over a weigh belt unit to record the tonnage of material to be treated. The weigh belt provides a continuous record of the performance of the system. A water spray bar attached to the conveyor will provide fugitive dust control.

Pugmill Operation

OHM's pugmill is specially designed to handle a wide variety of wastes and materials. The design criteria employed provides strength and durability as well as a varied range of material processing capability. The pugmill design is compatible with the lead contaminated soils from these sites.

The mixer is 4 feet wide by 9 feet long and is rated at 80 tons per hour capacity at 50 pounds per cubic feet. The unit requires a stable soil base. Based on an extended length configuration, coupled with closely placed paddles, the pugmill optimizes mixing thoroughness through increased blade interaction with material. Paddles are bolted onto structural steel shafts with replaceable shafts flanged on both ends for ease of maintenance. The paddles are high carbon steel and heat treated welded at both ends. The mixer is V-belt driven by two motors with variable speed drives. Dust control will be achieved in the pugmill by use of a water spray bar. Capacity is directly proportional to bulk density of the material; OHM anticipates a 60-ton per hour throughput of treated material based upon past experience.

During the daily pugmill operation, the pugmill operator routinely inspects the plant for overflows or leaks and corrects the production or equipment accordingly. Before startup each day, the pugmill is inspected for worn parts or corrosion and repaired if required.

Stabilization Additive Feeding

Stabilization additive is stored on site in a vertical cement silo. The silo is self-leveling and has a capacity of 50 tons of material. The silo is also equipped with a top mount baghouse for dust control during silo filling. A tanker will be located next to the silo to fill the silo pneumatically on an as-needed basis.

The silo feed would be controlled by an 8-inch diameter rotary screw feeder, powered by 3 horsepower motor. The motor speed is variable, to control the addition of media to facilitate a process rate of 60 tons per hour.



Post-Treatment Storage

A conveyor system will carry the treated material from the pugmill bed to the treated waste stockpile area. Prior to placement of the stockpiles, an HDPE/CA-6 stone/HDPE containment system will be placed on the ground. Each pile will consist of 100 cubic yards and each pile will be labeled. Processed waste piles will remain in the stabilization area until acceptable analytical results permit shipment. At the completion of the day's activity, the waste piles will be covered by a plastic tarp to prevent contact with precipitation and to minimize dust emissions from the stabilized material storage area.

To comply with disposal facility requirements, the treated material will be stockpiled in 100 cubic yard piles for post treatment confirmation. These samples will be taken as representative grab samples from each stockpile.

Process Control

The stabilization system will be calibrated on a weight-to-weight basis with the waste material to be stabilized and the stabilization additive. Initial calibration will be conducted by weighing an aliquot of the waste material with as-is moisture content. The weight of the stabilization additive will also be determined. These weights will be accomplished on site using portable scales. In a pilot test of the system, the calibration data will be run in test batches to determine if a suitable mix has been obtained by passing TCLP. If changes in the blends are required during operation, the operator will make the adjustment(s). Periodic samples will be taken to confirm initial calibration settings.

2.7.6 Operating Schedule

The proposed operating schedule is 8 hours per day, 6 days per week for an estimated duration of 2 months. Two hours will be required at the end of each day to cleanout process conveyors, pugmill, and reagent lines to minimize blockage problems the next operating day. OHM will run the plant only when a full day's production is stockpiled.

2.7.7 Process Weight

Waste battery casings/soil will be processed at a maximum flow rate of 70 tons per hour. The average flow rate is expected to be around 50 tons per hour. The flow rate for the stabilization reagent is expected to be approximately 17.5 percent of the wastestream. The reagent percentage has been determined by bench tests in the OHM Findlay Treatability Laboratory as shown in Appendix F.

2.7.8 Emissions Summary

Emissions to the air occur at the baghouse filter located on top of the reagent silo. The 300 barrel silo which will contain reagent has a baghouse vent filter rated at 99.6 percent capture



at 1.0 micron. Emissions may also occur at the pugmill feed inlet located at the top of the mill housing. In order to minimize the uncontrolled emissions, the mill housing will have a water spray bar to suppress dust.

Since the waste has considerable moisture associated with it, potential for any emissions do not exist at the waste receiving hopper or at the discharge conveyor. Should the waste material dry to the moisture level to create emissions, possible emission sources and the proposed control measures are as follows:

- ▶ Power screen hopper and discharge - hand held water spray
- ▶ Material feed hopper - attached water spray bar
- ▶ Pugmill housing - attached water spray bar
- ▶ Reagent silo - attached baghouse

2.8 SOILS TESTING TO VERIFY FIXATION PROCESS

OHM will utilize an off-site MRD-approved laboratory with 3-day turnaround time. Testing of treated soil will be by USEPA TCLP Method 1311, sample preparation Method 3010, and analytical Method 7420 (AA lead). OHM estimates 62 TCLP samples will be required for disposal approvals based on the estimated final volume of treated material. Soil piles that fail this testing process will be reprocessed through the pugmill system. OHM does not expect additional grinding will be required before rerun.

2.9 TRANSPORTATION AND DISPOSAL

OHM will submit a nonhazardous waste profile of stabilized waste to a landfill in the state of Illinois which will require 21 days for IEPA approval after analytical results are provided for the green sheet analysis. An alternate nonhazardous landfill will also be provided. The processed nonhazardous waste will be stockpiled in the designated area for shipment to the approved nonhazardous landfill after passing TCLP analysis. The wastestream will be preapproved to permit shipment during processing. Nonhazardous waste stockpiles will be staged by proper identification to parallel identification during processing. It is anticipated 6,000 tons of stabilized waste material will be the maximum amount of material staged on site. Shipment of nonhazardous waste will take approximately 3 weeks depending upon the accepted landfill schedule. OHM anticipates this maximum storage amount will never be achieved since shipment is to progress during the stabilization operation.

Decontamination water will be used for dust control during the loadout of processed materials. OHM anticipates minimal disposal of any decontamination liquids due to the usage of this water for dust control and the reagent mixing.



2.10 SITE SECURITY

OHM personnel will monitor site security during the daylight operating hours. Security guards will monitor site security on the nonoperating hours. The existing perimeter fencing will be maintained with appropriate signs to keep out unauthorized personnel.

Personnel operating the stabilization plant will have hand-held portable radios for continual communication to the base station for emergencies. Air horns will also be available to signal emergency condition for site personnel. The base station will be prepared to call in emergency services required for the site.

2.11 PLANT DEMOBILIZATION

All equipment operating in the exclusion zone will be cleaned with high-pressure water for decontamination of residual or hazardous waste. The pugmill, conveyors, and all structures will require sand blasting to remove hardened stabilized material buildup. This residual material from the process operation will not require further stabilization and will be disposed with the nonhazardous stockpile.

All protective liners for containment systems will be cut up and stabilized if they fail TCLP analysis. The CA-6 stone material between the liners will only be stabilized if the material fails the TCLP lead analysis. All containment system materials will be shipped to the approved landfill. All wastewater will be mixed with processed material for shipment, where possible. Any remaining decontamination water will be disposed at an approved facility. All residual wastes from the process treatment and stockpiles will be removed and properly disposed. Only existing contaminated soil will be left on site.

2.12 FINAL PROJECT REPORT

OHM will issue a final report at the completion of the project. The report will be prepared in draft final form for USACE review. The report will contain a summary of the work performed at each location, photographic documentation, analytical report, operation of treatment process weights, and transportation and disposal documentation.



3.0 TECHNICAL APPROACH

This section discusses the operational methods, types of personnel, and equipment which will be utilized to complete the scope of work.

3.1 SCHEDULE MONITORING AND CONTROL

The work tasks will be performed according to the schedule developed for the project (see Figure 3.1). Any major modifications to the work plan will be submitted to USACE for review prior to the actual implementation of the modification.

The schedule will be monitored and controlled in conjunction with the tracking of costs through the use of computerized cost/resource tracking and project management techniques developed by OHM.

3.1.1 Submittals

Submittals include this final project work plan submitted as per the USACE scope of work dated November 17, 1992; daily submittals; weekly status reports; hazardous-waste manifest biennial reports; hazardous-waste manifests; IEPA letter for special manifest procedures; and a final report.

Weekly status reports will be prepared in accordance with the requirements of the scope of work and submitted by 0700 Central Standard Time on each Monday to the locations specified in Table 1 of the scope of work.

OHM will submit to USACE estimates of the amounts and types of wastes generated at the location for disposal in the weekly status reports and annual and biennial hazardous-waste manifest reports. OHM will also prepare special waste biennial reports for non-hazardous special waste disposal at facilities outside of Illinois. OHM will obtain currently required reporting forms related to the shipment and disposal of hazardous waste as per the scope of work.

Based on information provided by USACE/USEPA/IEPA, the excavation sites are part of the NL Industries/Tara Corp. Superfund Site and waste excavated from these sites will still require hazardous waste manifests for shipping to the Trust 454 site. The letter from the IEPA with specific manifest details will be included in the final report. OHM will prepare manifests for USACE review, approval, and signature prior to the scheduled shipment of any hazardous wastes. OHM will also submit relevant shipping papers for nonhazardous wastes which may require transportation and disposal from this project. OHM's Midwest Region Transportation and Disposal Department will prepare hazardous waste manifests, nonhazardous waste shipping papers, and bills of lading for nonhazardous waste. OHM's transportation and disposal coordinator will review all waste profiles, land disposal restriction notifications, certifications, and waste manifests prior to their submittal to USACE.



FIGURE 3.1

OHM's transportation and disposal coordinator will submit all relevant supporting documentation such as analytical reports and material safety data sheets with the above-mentioned documents, accompanied with a cover letter which describes the logic by which specific waste disposal alternatives are suggested by OHM to USACE. OHM will not ship any wastes without prior approval and signature of waste manifests by USACE on behalf of the USEPA.

The preparation of the final report is discussed in Section 2.8 of this work plan.

3.2 PRECONSTRUCTION ACTIVITIES

Preconstruction activities for this project include the following items:

- ▶ Attending a preconstruction meeting with USACE
- ▶ Issuing subcontracts for subcontracted work which can be defined prior to initiation of the project
- ▶ Communicating with JULIE to locate potential underground utilities at the job site
- ▶ Obtaining permits as needed
- ▶ Obtaining soil samples for waste characterization
- ▶ Others as needed
- ▶ Videotaping of residential property so that it can be properly restored following completion of the project

OHM understands that USACE has arranged for right of entry to the contaminated areas from the USEPA and adjoining land owners as necessary.

3.3 CONSTRUCTION ACTIVITIES

The primary construction activities for this project include the following:

- ▶ Mobilization of personnel and equipment
- ▶ Site preparation including clearing and grubbing of support areas and the set up of site office, support zones, decontamination stations, and exclusion zones.
- ▶ Site preparation and fencing of the stabilization area at Taracorp/Trust 454 property



- ▶ Stabilization of lead contaminated hazardous waste
- ▶ Excavation of contaminated soil
- ▶ Visual and/or analytical determinations of removal criteria fulfillment
- ▶ Backfill and compaction activities
- ▶ Paving and/or landscaping activities

3.3.1 Site Preparation

Site preparation includes the setup of a support office near the work area and the establishment of support zones, decontamination stations, and exclusion zones.

The office will be set up in buildings owned by the USACE located at the former USACE maintenance facility. Electrical power is already available at site, and telephone lines will be arranged by OHM. The off-shift storage of secured equipment will also be at this location. A secure, fenced area for the storage of the nonhazardous wastes will be constructed on Taracorp/Trust 454 property.

Many areas, mainly in Eagle Park, will need to be grubbed prior to excavation. An advance crew with appropriate equipment such as brush-hogs will clean and prepare these locations.

Dust control will be a major effort. A hydro meter with hose will be available at all times to prevent fugitive emissions. Water from decontamination sources will be recycled this way.

At an approved date and time, the pugmill system will be brought on site and set up to treat soil type materials at the Trust 454 site.

All sampling equipment utilized at the locations will be decontaminated according to the procedures described in the CSAP.

3.3.2 Site Excavation

Each of the 22 locations has unique characteristics which mandate particular methodologies of remediation. But, in general, the locations can be separated into two categories: residential yards and alleys/driveways/parking lots. This section describes the general remediation methodology for these two categories and the following sections describe each individual location's nuances that need to be addressed.

3.3.2.1 Residential Areas

Most of the residential yards that need to be remediated will include the removal of sod and a varying depth of soil. These wastes will be excavated using a tracked excavator, backhoe,



and/or a Bobcat. At some locations hand digging will be necessary. The largest piece of equipment that can be utilized given the logistics of the location will be used. Hazardous soils will then be loaded into the licensed hauler trucks for transportation to the Trust 454 property for these wastes excavated as hazardous as indicated by the previous analytical results provided by Woodward-Clyde consultants (see Appendix A).

3.3.2.2 Alleys/Driveways/Parking Lots

Most of the alleys, driveways, and parking lots to be remediated are aggregate soil mixtures. Most locations are accessible to the tracked excavator but some will require smaller equipment and hand digging. The wastes removed from the alleys and parking lots will be segregated as hazardous or nonhazardous waste according to the Woodward-Clyde report and handled as described above for the residential properties. The hazardous waste will be directly loaded into licensed haul trucks and hauled to the stabilization operation site. Alleys will be backfilled and chip sealed. The alleys will require minor landscaping at the edges of the pavement (i.e., top soil, raking, and seeding).

3.3.2.3 Proposed Site Excavations

The following list of alleys and residential properties are scheduled for excavation during this phase of the project. The estimated volume of hazardous soils and nonhazardous soils from current information for each site are included.

	<u>Hazardous</u>	<u>Nonhazardous</u>
Alley 19	233	133
Alley 6	314	179
Alley 7.5	206	118
Alley 62	140	80
Alley 65	103	59
Alley 65.5	114	65
Alley 53	447	254
Alley 62.5	83	47
207 Terry	488	95
1217 Market	167	32
Alley 13	272	155
Alley 36.5	17	10
Alley 49	364	208
Alley 54.5	264	150
123 Booker	194	38
104 Carver	98	19
212 Carver	98	19



	<u>Hazardous</u>	<u>Nonhazardous</u>
209 Hill	194	38
211 Hill	194	38
204 Terry	531	130
210 Watson	194	38
214 Watson	<u>194</u>	<u>38</u>
TOTAL	4,909 cubic yards	1,943 cubic yards

3.4 ON-SITE WASTE TREATMENT

Treatment of waste materials are as described in Section 2.7 of this work plan.

3.5 WASTE TRANSPORTATION AND DISPOSAL

Wastes removed from the several sites will be transported to one of two locations. Hazardous wastes will be transported to the Trust 454 property for stabilization. This transportation will be documented using manifests approved by the IEPA. Stabilized hazardous waste which will be re-characterized as nonhazardous waste will be transported to a nonhazardous RCRA Subtitle D landfill. Nonhazardous wastes removed from the several sites will be transported directly to the nonhazardous waste Subtitle D landfill. OHM will utilize licensed haulers and disposal firms.



APPENDIX G

STABILIZATION PAD CONTAINMENT SYSTEM DESIGN

**ADDENDUM NUMBER 2 TO THE FINAL
AMENDED WORK PLAN FOR STABILIZATION
OF HAZARDOUS WASTE IN GRANITE
CITY, MADISON, AND VENICE, ILLINOIS,
ASSOCIATED WITH NL INDUSTRIES/
TARACORP SUPERFUND SITE FOR
SAMPLING, STABILIZATION, AND
ANALYSIS FOR
ACCEPTANCE CRITERIA**

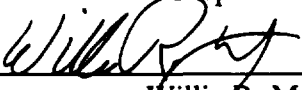
Prepared for:

United States Army Corps of Engineers
Omaha District Office

Submitted by

OHM Remediation Services Corp.
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February 2, 1994
Project 13407

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1.0 INTRODUCTION

OHM Remediation Services Corp. (OHM), a wholly owned subsidiary of OHM Corporation, is presenting this Contractor's Sampling and Analysis (CSAP) Amendment Number 2 to address the sampling and analysis efforts required to verify the soil stabilization/fixation process that will be employed on the lead contaminated soil obtained from various locations in the area of Granite City, Illinois. This project is under OHM's Contract No. DACW45-89-0516 with the United States Army Corps of Engineers (USACE), Delivery Order No. 58.

The lead contamination which is present in the soils to be treated is from the demolition and disassembly of lead acid batteries. Samples of treated material produced by a pugmill soil treatment process will be collected at the rate of one sample for every 100 cubic yards of treated soil. After sample collection, the samples will be shipped to ECC, Inc. in Cincinnati, Ohio, and analyzed for TCLP lead levels by USEPA SW-846 Methods 1311 (TCLP), 3010, and 7420 (AA Lead). Soils which fail this test will be reprocessed through the pugmill system.



2.0 OBJECTIVE

The objective of this sampling and analysis activity is to verify that the stabilized material meets the special waste disposal criteria. The stabilized samples will be analyzed for TCLP lead by the USEPA SW-846 Methods. These analytical results will be used to verify that the stabilization process is working as expected.

2.1 DATA QUALITY OBJECTIVES

The data quality objective for this sampling activity is as follows:

- ▶ To generate quantitative data sufficient to verify that the on-site treatment process is effective and that the treated material can be disposed as a special waste.

2.2 DATA TYPE

Chemical analyses of stabilized soil sample(s) for TCLP lead will be via the USEPA methods.

2.3 DATA USE

The objectives of data use are as follows:

- ▶ To monitor the effectiveness of the soil treatment process
- ▶ To supply information to the selected disposal facility on TCLP lead levels
- ▶ To identify materials requiring reprocessing

2.4 DATA QUANTITY NEEDS

Stabilized sample(s) must be representative of the treated soil pile(s).

2.5 DATA QUALITY NEEDS

OHM will complete its work according to the quality factors presented in Table 2.1.



TABLE 2.1					
PRIMARY DATA QUALITY FACTORS					
Data Use	Analytical Level	Primary Contaminant	Level of Concern	Required Detection Level	Critical Sample
Process verification	1	Lead	TCLP lead 5 milligrams per liter	200 micrograms per liter	Sample(s) must be representative of the process run (100 cubic yards)

2.6 PARCC PARAMETERS

2.6.1 Precision

The selected laboratory will follow USEPA protocol for the required analytical methods. Precision will be method/matrix dependent. Replicate samples will be analyzed at a rate of 10 percent for each laboratory batch that is run. Duplicate field samples will be taken with every tenth sample. Duplicate samples will be split between the outside subcontractor laboratory and the Missouri River Division laboratory. Overall analytical precision should be in the ± 25 percent range.

2.6.2 Accuracy

Accuracy will be method/matrix dependent. Method spikes and method spike duplicates will be run on a batch basis by the selected laboratory. Spikes and spike duplicates will be analyzed at a rate of 10 percent for each batch that is run. Accuracy for these runs should be ± 20 percent.

2.6.3 Representativeness

Multiple samples will be collected from each run of 100 cubic yards and composited to produce a sample that is representative of the treated and stored soil pile.

2.6.4 Completeness

A goal of 95 percent completeness has been established for this sampling and analytical event. Completeness is defined as that value obtained by dividing the number of valid acceptable measurements obtained by the total number of measurements obtained.



TABLE 2.2				
CHEMICAL QUALITY OBJECTIVE SUMMARY				
Parameter	SW-846 Method	Accuracy	Precision	Completeness
TCLP lead	1311, 3010, 7420	± 20 percent	± 25 percent	95 percent



3.0 STRATEGY

OHM's approach will be to use essentially normal soil pile sampling equipment unless problems with frozen and/or solidified materials are encountered. If this occurs, a power chisel will be employed to break up the treated soil material so that appropriately sized soil material can be obtained for samples.

The following will also apply for sampling on the site:

- ▶ Samples will be collected after a 24-hour setup has occurred for the pile.
- ▶ Treated soil materials will be taken from each pile (one sampling point per pile quadrant) and composited to make a sample for analysis.

Table 3.1 summarizes OHM's approach to sampling the treated soil piles.



<p style="text-align: center;">TABLE 3.1</p> <p style="text-align: center;">OBJECTIVES, STRATEGIES, AND</p> <p style="text-align: center;">METHODOLOGIES OF SAMPLING</p>							
Objective		Methodology	No. of Samples	Container and Volume	Analysis	Preservation	Sampling Location
Sampling of treated soil piles to verify treatment process.	Sample piles per quadrant and composite materials into one sample.	All samples will be collected using hand or power tools suitable for the task (i.e., spatulas, small shovels, trowels and power chisels).	50 + 5*	32-ounce glass with Teflon-lined lid; precleaned to USEPA protocols	SW-846 Methods 1311/3010 7420	Cool to 4 degrees Celsius, package and ship to selected laboratory	See text.

*Samples to be split with MRD Laboratory

4.0 METHODOLOGY

4.1 LOCATION OF SAMPLE POINTS ON TREATED SOIL PILES

The sampling of the soil piles will involve locating and collecting soil materials from points on each pile. Figure 2.3 of the Work Plan, Site Map, Granite City, indicates where the piles will generally be located.

4.2 SAMPLING SKETCHES

Sampling sketches will be prepared, if needed, to show where samples were taken for each pile of treated soil.

4.3 DECONTAMINATION OF SAMPLING EQUIPMENT

A stainless steel shovel and stainless steel hand scoop will be used to collect samples. If soil surface freezing and/or solidification problems are encountered, a power chisel equipped with a stainless steel tip will be used. The chisel will be an electric or pneumatic unit with associated support equipment. Since the samples for each pile are to be composited, the sampling equipment will be decontaminated before sampling begins, between piles, and at the end of each day's sampling activities. The general procedures for decontamination follow the procedures in Section 5.4 of the CSAP.

4.3.1 Sampling Equipment Decontamination

For equipment used for sampling, the following steps shall be accomplished:

- ▶ Wash with Alconox and tapwater
- ▶ Rinse with tapwater
- ▶ Rinse with dilute (0.1N) nitric acid.
- ▶ Rinse with distilled water or deionized water
- ▶ Air dry

4.4 SAMPLE COLLECTION

The samples will be taken with a stainless steel shovel and stainless steel scoop from just below the surface of the treated soil. A power chisel may be needed to break up the soil surface and may be needed to produce pieces of frozen/solidified treated soil that are small enough to fit in sample jars. Appendix A contains a listing of equipment that will be required for the sampling activity. Table 4.1 summarized the on-site sampling activities.



TABLE 4.1							
PROJECT SAMPLING OBJECTIVES							
Parameter	No. of Field Samples	No. of Field Duplicates	No. of MS/MSDs (Lab)	Total Samples (Field)	QA Dups/Splits	QA MS/MSDs	Total QA Samples
Lead Contaminated Soil							
Lead	50*	5	5**	55	5	*	5

*Estimated number

**MS/MSDs are to be run at the rate of 1 per batch of 20 samples. MS/MSDs are to be run as per the method by the analytical laboratory at no cost to the government.

4.4.1 Soil Pile Volume Determinations

Measurements of the pile(s) will be taken to calculate the volume of the pile(s). The method for a conical or pyramidal pile measurement is as follows.

Step 1- Measure height and base parameters (i.e. length/width for rectangle, radius of circle, etc.) of pile.

Step 2. Determine area of base of pile. If base of pile is irregularly shaped divide into regularly shaped areas and figure separately. Add areas together to obtain total area of base.

Square/Rectangle:	$A = L \cdot W$
Circle:	$A = \pi \cdot r^2$
Ellipse:	$A = \pi \cdot a \cdot b$
Triangle:	$A = 1/2 B \pi \cdot h$

Where:

A = Area of the base of the pile
 L = Length of one side of a square or rectangle
 W = Width of other side of rectangle
 $\pi = 22/7$ or 3.14
 r = Radius of circle
 a = 1/2 of semiminor axis
 b = 1/2 of semimajor axis
 B = Base length of triangle
 h = Distance from base to top of triangle perpendicular to base.



Step 3. Determine volume of pile. For all base shapes use the following equation:

$$V = 1/3 A \cdot H$$

Where:

V = Volume of pile

A = Area of the base of the pile

H = Height to apex of the pile

NOTE: If the top of the pile is not complete, estimate height to apex from top of pile. Determine volume of pile as if it were complete to estimated apex. Determine volume of missing top part in the same manner. Subtract missing top from estimated total pile volume to obtain actual pile volume.

The above measurements will be used to determine when the pile size has reached the range of 90 to 110 cubic yards. At that point sampling will be accomplished.

4.4.2 Sampling Procedures

The steps to be followed for the treated soil pile sampling are as follows:

1. Determine/identify the sampling point locations for the soil pile. The sampling locations should be near the pile's base. Material will be collected from four points on the pile to make up one sample.
2. Pile sampling points should equidistant from each other and 3 feet above the pile base. For sampling purposes, divide the pile into four quadrants (four "pie-like" wedges) and collect materials from near the center of each wedge shaped quadrant.
3. At each sampling point remove surface debris such as snow or pieces of wood. Use a stainless steel shovel.
4. Don latex or nitrile sample gloves and excavate a hole 8 inches deep using the power chisel (if needed due to frozen/solidified treated soil) and/or a shovel. Clean out the hole using the shovel. Discard the excavated material onto the pile.
5. Don new clean sample gloves and dig into the sides and bottom of the hole to obtain a treated soil sample using a stainless steel scoop. The desired objective is to obtain the sample materials from the first 8 inches of the treated soil.



6. Using a 4-quart stainless steel mixing bowl, composite the material collected from the four sampling points into one sample. Fill a 32-ounce jar with composited material. Put any excess remaining soil material back onto the soil pile that it came from.
7. After obtaining an adequate sample volume, seal the sample jar and label it. Apply a custody seal if one is required, then record the pertinent information about the sample(s) in the field logbook.
8. Place any used expendables in a trash bag (personal protective equipment [PPE] and similar). Decontaminate any non-disposable tools as described earlier if sampling is finished for the day or if a new 100-cubic yard batch of soil is to be sampled. Add trash bag that contains the PPE materials to the on-site wastestream.

4.4.3 QA Sampling

Five QA split samples will be sent to the USACE QA laboratory by overnight delivery for government monitoring of sampling and contract laboratory performance. The government (USACE) QA laboratory designated for this project is:

U.S. Army Corps of Engineers
Missouri River Division (MRD) Laboratory
ATTN: CEMRD-EP-LC (Sample Custodian)
420 South 18th Street
Omaha, NE 69102
Telephone: (402)444-4314

OHM shall notify the QA Laboratory 1 week prior to the first delivery of samples. The QA laboratory will also be notified when final shipment of samples has been sent at the completion of the sampling activities. OHM will also ensure that the project identification "MRD LIMS ____" will be added to the labels and chain-of-custody forms for the QA samples shipped to the MRD laboratory.

OHM will also submit all data for the samples to the MRD laboratory and the USACE Omaha District office for data evaluation and QA/QC comparison within 30 days of receipt of the samples. **The report package** will include all sample and internal QC results such as method blanks, spike and spike duplicate recoveries, and replicate analyses.

Duplicate samples will be taken at the rate of one for every 10 samples collected. These will be analyzed and analytical results will be compared. Splits from these samples will be sent to the MRD laboratory as described above.



4.5 SAMPLE DOCUMENTATION

The sample documentation consists of sample labels, sampler's logbook, field sampling notes, sketches, custody seals, and chain-of-custody forms. Sample labels will be completed at the time the jar is sealed and will be completed using indelible waterproof ink. Entries will be made in the notes as close as possible to the time the noted activities occur.

4.6 SAMPLE CONTAINERS, PRESERVATION, AND SHIPMENT

Thirty-two ounce glass sample jars with Teflon-lined lids, cleaned to USEPA Protocol A specifications, will be used for sample containerization. All sample jars will be filled as close to capacity as practical during sample collection and tightly sealed. The lids of the jars will be sealed with tape to prevent them from loosening during transport. The sealed jars will be stored in sample coolers packed with bags of crushed ice to cool them to 4 degrees Celsius. The ice will be double bagged with leakproof plastic bags. The sample jars will be placed in double Ziplock bags to keep them dry in the event of leakage of water from the bags of ice. Bubble wrap will also be packed around the samples to keep them from breaking during shipment. The ice will be replaced, as necessary, to keep the samples cold prior to shipment. A chain-of-custody form will be prepared for each cooler and placed in the top of the cooler in a waterproof bag. The coolers will be sealed with four custody seals. Sample preservation and holding times will follow the USEPA guidelines. Sample containers will be shipped and labeled in accordance with current United States Department of Transportation requirements.



5.0 ANALYSES

5.1 ANALYTICAL PROCEDURES

Information on the analyses which need to be accomplished on the treated soil samples can be found in the Analytical Request Form in Appendix B of this addendum.

5.2 RETENTION OF SAMPLES

Any remaining portions of samples must be held until further notification from on-site USACE or OHM project management or from OHM's Midwest Region Transportation and Disposal Department. These samples may be utilized for additional testing.



6.0 DATA ANALYSIS

After the samples have been tested and OHM has received a report from the laboratory, the report will undergo a full QA review by an OHM project chemist. Any problems with data quality or reporting will be resolved at that time.

Analytical results will be forwarded to OHM management for review and distribution.



APPENDIX A

SAMPLING EQUIPMENT LIST

SAMPLING EQUIPMENT LIST

The following equipment and materials will be required to perform treated soil pile sampling at the main site.

- ▶ **Soil Pile Description and Marking Equipment List**
 - Calculator, pocket size (local or individual purchase)
 - Mechanical pencil and graph paper (local or individual purchase)
 - Surveyor's stakes (Forestry Suppliers P/N 39514)
- ▶ **Documentation List**
 - Chain-of-custody forms
 - Custody seals
 - Field logbooks (sample logbook and field sampler's notebook)
 - Indelible waterproof ink pens for labels
 - Marking pens, such as Sharpies and Mean Streaks
 - Other OHM or site-specific forms as required per the CSAP
 - 200-foot tape, Lufkin 1708D (Forestry Suppliers P/N 33349)
- ▶ **Decontamination Equipment List**
 - Alconox detergent (VWR P/N 21835-032)
 - Deionized water (local purchase)
 - Isopropyl alcohol (2-Propanol) (VWR P/N JT9334-3)
 - Nitric acid, trace metal grade (VWR P/N JT9598-0)
 - Scrub brushes and source of tap water (local purchase)
 - Wash buckets or tubs/pans, 5-gallon size (local purchase)
- ▶ **PPE List**
 - Cotton work gloves (OHM supplied)
 - Sample gloves, latex or nitrile (PVC is not acceptable)
 - Trash bags, 30-gallon size, heavy duty (local purchase)
 - Other PPE required by the work plan or the health and safety plan (OHM supplied)



► Sampling Equipment List

- Sample containers, precleaned glass of appropriate size (32-ounce with Teflon-lined lids).
- Spoon/spatula, stainless steel (VWR P/N 57952-107)
- Scoop, stainless steel (Forestry Suppliers P/N 77563)
- Chisel head hammer, 24-ounce (Forestry Suppliers P/N 33349)
- Spade, stainless steel (Forestry Suppliers P/N 77683)

► Packaging List

- Bubble wrap
- Cooler, 48- to 54-quart (Rubbermaid or Coleman) (local purchase)
- Plastic Ziplock bags, 1-quart size or larger for sample jars (local purchase)
- Plastic Ziplock bags, 1-gallon size or larger for ice (local purchase)

► Optional Cold Weather Equipment

- Power chisel with removable/detachable stainless steel chisel point
- Gasoline powered generator or air compressor equipped for wintertime operation to run the power chisel



APPENDIX B

ANALYTICAL REQUEST FORM



OHM Corporation

REQUEST FOR ANALYTICAL SERVICES**PROJECT INFORMATION**

Project Name:	USACE Granite City	Project No:	13407
Client:	USACE	Project Manager:	Larry Hoffman
Project Location:	Granite City, IL	Technical Manager:	
Date Submitted		QA Officer:	Guy Gallelo, Jr.

Laboratory Information

LABORATORY INFORMATION	
Laboratory Name	ECC
Street Address	3235 Omni Dr
City, State	Cincinnati, Oh 45245
Phone Number	(513)752-2950
Laboratory Contact	Kristy Music
Submittal Date	
Date Received	

APPROVALS

	SIGNATURES
QUALITY ASSURANCE OFFICER	
PROJECT MANAGER	
CLIENT REPRESENTATIVE	

SAMPLE INFORMATION

Quantity	Matrix	Description	Analyses	Turn-around time
	Solid	stabilized material	TCLP/Lead	

Sampling Quality Assurance Samples

Quantity	Sample Matrix	Field Quality Assurance Samples
		Field Blanks (Matrix Blanks)
		Equipment Blanks
		Trip Blanks
		Replicate Samples

Laboratory Quality Assurance Quality Control

Quantity	Matrix	Quality Assurance Samples Required
1 per batch		Method Blank
1 per batch		Method Spike
		Method Spike Duplicate
1 per batch		Matrix Spike
1 per batch		Matrix Spike Duplicate

Required Laboratory Certifications

Request	Certification	Request	Certification
	EPA Contract Laboratory	XXX	Corp of Engineers
	State:		MBE, WBE or SDB
	Client:		Other

Deliverables

Request	Deliverable	Request	Deliverable
X	Standard Analytical Report		QC raw data
X	Analytical Summary		Instrument raw data
X	QC Report		CLP package

METALLIC PARAMETERS BY AA, AA FURNACE OR ICAP

Quantity	Matrix	Parameter	Reference Method	Detection Limit
	Solid	TCLP/Lead	SW-846, 1311/3010/7420	0.5 mg/l

**AIR SAMPLING PLAN
ADDENDUM TO THE QUALITY ASSURANCE
PROJECT PLAN FOR THE STABILIZATION
ACTIVITIES ASSOCIATED WITH THE NL
INDUSTRIES/TARACORP SUPERFUND SITE
GRANITE CITY, ILLINOIS**

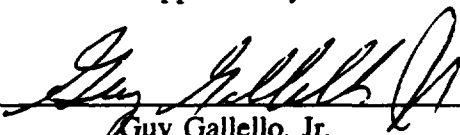
Submitted to:


United States Army Corps of Engineers
Omaha, Nebraska

Prepared by:

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February 1, 1994
Project 13407.2

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2.0 PROJECT DESCRIPTION

2.1 SITE HISTORY

The NL Site includes the NL Industries/Taracorp Plant, a former secondary lead smelting operation located at 16th Street and Cleveland Boulevard in Granite City, Illinois. Prior to 1903, the plant included various smelting related equipment and processes. From 1903 to 1983, secondary lead smelting occurred on site. These activities were discontinued during 1983 and equipment dismantled.

In July 1981, St. Louis Lead Recyclers, Inc. (SLLR) began using equipment on adjacent property owned by Trust 454 to separate components of the Taracorp waste pile. The objective was to recycle lead bearing materials to the furnaces at Taracorp and send hard rubber off site for recycling. SLLR continued operations until March 1983 when it shut down its equipment. Residuals from the operation remain on Trust 454 property as does some equipment.

A State Implementation Plan for Granite City, Illinois, was published in September 1983 by the Illinois Environmental Protection Agency (IEPA). The IEPA's report indicated that the lead nonattainment problem for air emissions in Granite City, Illinois, was in large part due to emissions associated with the operation of the secondary lead smelter operated by Taracorp and lead reclamation activities conducted by SLLR. The IEPA procured Administrative Orders by Consent with Taracorp, SLLR, Stackcorp, Inc., Tri-City Truck Plaza, Inc., and Trust 454 during March 1984. The orders required the implementation of remedial activities relative to air quality.

NL Industries, as former owner of the site, voluntarily entered into an Agreement and Administrative Order by Consent with the United States Environmental Protection Agency (USEPA) and IEPA in May 1985 to implement a Remedial Investigation/Feasibility Study (RI/FS) for the location and other potentially affected areas. Taracorp was not a party to the agreement due to the fact that it filed for bankruptcy. The USEPA determined that the location was a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) facility, and it was placed on the National Priorities List on June 10, 1986.

2.2 DESCRIPTION

This action requires the excavation, treatment, and disposal of fill material placed in alleys, parking lots, driveways, and yards in residential communities. The communities include Granite City, Madison, and Venice, Illinois. The Record of Decision (ROD) established the action levels for this project at 500 parts per million (ppm) of lead for residential areas and visibly clean for driveways, alleys, etc. Following the removal of the contaminated material, the impacted areas will be restored. This restoration will include sodding the yards and placing rock on or paving the alleys, driveways, and parking lots.



TABLE 4.2			
ACTION LEVELS			
Activity	Parameter	Method	Action Level
High Volume Perimeter Air Sample	Total Lead	Modified NIOSH 7082	*1.5 $\mu\text{g}/\text{m}^3$ (micrograms per cubic meter) mean for calendar quarter 7 $\mu\text{g}/\text{m}^3$ daily (24 hour sample)
Personnel Air Sample	Total Lead	NIOSH 7082	0.05 (milligrams per cubic meter [mg/m^3])

*This action level is based on the Federal Environmental Protection Agency National Ambient Air Quality Standard (NAAQS) for total lead, as specified by 40 CFR 50.12. This standard is based on an arithmetic average over a 90 day period.

The value, 7 $\mu\text{g}/\text{m}^3$, is an action level for any single day, and is based on the hours worked by personnel (see Equation 1 below) to ensure compliance with NAAQS (which is based on a 90 day period).

Equation 1: Action Level (7 $\mu\text{g}/\text{m}^3$) =

$$(1.5 \mu\text{g}/\text{m}^3 \text{ for the quarter})$$

$$(5 \text{ days operation} / 7 \text{ days per week}) (8 \text{ hours operation per day} / 24 \text{ hours per day})$$

If a single sample exceeds 7 $\mu\text{g}/\text{m}^3$, work activities will be evaluated to identify the source of emission and appropriate dust control measures shall be instituted. It is important to note that a single air sample found to be in excess of 1.5 $\mu\text{g}/\text{m}^3$ is not in violation of the EPA standard.

There are no provisions to prepare a spike sample for the air sampling program. The accuracy and precision of the analysis is based on the method.

OHM will measure the presence of contamination on sampling equipment by submitting a blank mixed cellulose ester (MCE) filter with each batch of personnel samples. The sampling equipment will be decontaminated before sampling begins and in between sampling events. The sample technician will use sample gloves to minimize the spread of contamination from the sample to equipment and to minimize cross contamination.



5.0 FIELD ACTIVITIES

Air samples will be collected around the perimeter of the exclusion area during the course of this project. The samples will be collected using a high volume air pump, equivalent to a GMW 2000-H. The pump is enclosed in weatherproof housing with the sample being collected approximately 4 feet from the surface of the ground. The suspended dust will be collected on a borosilicate filter, approximately 80 square inches (in²) in area.

Personnel air samples will be collected using a battery-operated sample pump, equivalent to a Dupont Alpha 1. The pump is attached to an individual and worn during the work performed in the exclusion area. The suspended dust is collected on a 37-millimeter MCE filter which is positioned in the breathing zone of the individual.

The high volume air samples will be collected from the perimeter of the exclusion zone. The locations of the pumps will be selected at the beginning of the project and will position the four pumps on each side of the perimeter surrounding the stabilization area. The positions of the pumps will be documented on a site map. The high volume samples will be exchanged each 24-hour period that intrusive work is performed in the exclusion zone.

One of the downwind samples will be submitted to the laboratory for analysis, representing each day where intrusive work is performed in the exclusion zone. The remaining three samples will be archived by the OHM field laboratory. The remaining three samples will be analyzed in any event where the concentration is observed to be in excess of 1 percent of the action level specified in Table 4.2.

The personnel sampling pumps will be worn by persons assigned to work in the exclusion zone. A maximum of three pumps will be worn on any one day, however, the specific number will vary according to the number of people assigned to work in the exclusion zone.

The personnel samples will be exchanged at the end of the shift. The sample will run for the entire shift. The person wearing the pump will be assigned to work in the exclusion zone but may work in the support zone as is required by the job assignment. In this way, it is possible to measure the 8-hour, time weighted average exposure for that individual on that specific day. This sampling regiment is required by OSHA and is the basis for the permissible exposure limit.

The glass fiber filters will be placed in a polyethylene bag and sealed. The personnel sample will remain in the sealed sample cassette. The ends of the sample cassette will be sealed with plugs, provided by the laboratory. No preservation is required to maintain the integrity of the sample. There is no limit on the holding time for the air samples.

